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Accidents.

Farming a hazardous occupation! By C.M. Seagraves. Nation's Agriculture. v. 12, no. 5. March, 1937. p. 8, 10. Gives farm accident chart.

Agricultural Engineering.

Agricultural engineer as a farm manager. By L.G. Heimpel. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 62. Mechanization is greatest boon ever experienced in agriculture anywhere. It has progressed without much attention from scientists to point where it is one of most important factors in agricultural prosperity. What it will be possible to accomplish by way of improvement in mechanization will depend largely upon extent to which agricultural engineer will interest himself in actual farm management.

Call in the farm engineer! By L.F. Livingston. Country Home. v. 60, no. 11. November, 1936. p. 18-19. Tells how modern engineering has brought new profits to farm owners.

Economical equipment, better buildings, more irrigation, are farm trends. Utah Farmer. v. 57, no. 14. February 25, 1937. p. 19.

Agriculture.

Looking ahead in American agriculture. By O.E. Baker. American Fertilizer. v. 86, no. 1. January 9, 1937. p. 10-11, 24, 26.

Air Conditioning.

Air conditioning applications to farm buildings. By S.A. Witzel. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 71-72, 74. Some successful and profitable applications have been made on Wisconsin farms during past three years. Gives brief description of these projects.

Air conditioning specifications; specifications of "Year-round" and "Summer-only" equipment. Electric Refrigeration News. v. 18, no. 13. July 29, 1936. p. 4, 6, 8, 10, 12, 14, 16.

Humidity and low temperatures. By Wallace H. Martin and Earl C. Willey. Power Plant Engineering. v. 41, no. 2. February, 1937. p. 112-113. Growing importance of humidity in low temperature refrigeration prompts construction of new chart covering range from -40 to +50 degrees Fahrenheit for all values of humidity.

Specifications of humidifiers. Electric Refrigeration News. v. 18, no. 13. July 29, 1936. p. 28.

Air Conditioning. (Cont'd)

Specifications of winter conditioners. Electric Refrigeration News. v. 18, no. 13. July 29, 1936. p. 24, 26.

Alcohol Fuel.

Alcohol-gasoline as motor fuel: Letter from Benjamin T. Brooks. Industrial and Engineering Chemistry. v. 28, no. 12. December, 1936. p. 1477-1478.

Alcohol-gasoline used as motor fuel. Bakers Technical Digest. v. 11, no. 7. February, 1937. p. 182. Brazilian Government by a recent law compelled gasoline importers to purchase a certain amount of alcohol, and to sell a mixture of 10 per cent alcohol and 90 per cent gasoline. Alcohol is supplied by the Institute de Assucar e Alcool to petroleum companies. Alcohol is obtained by well-known process of fermentation from molasses and, on minor scale, directly from sugar. In Brazil alcohol-blended fuels are marketed only in states which produce alcohol in sufficient quantities to meet their needs.

Alcohol motor fuel - the case pro and con. World Petroleum. v. 7, no.6. June, 1936. p. 306-307. Higher cost of alcohol makes open competition of blends with pure gasoline impossible. Larger consumption required because of alcohol's lower heat value.

Alcohol motor fuels may be dropped by Germany. Oil, Paint and Drug Reporter. v. 130, no. 11. September 14, 1936. p. 5. High cost, use of synthetics, and shortage of animal feed bring disfavor.

Europe's huge bill for alcohol fuel. World Petroleum. v. 7, no. 6. June, 1936. p. 309-318. Statistical examination shows tremendous yearly losses sustained by motorists and State Treasuries through compulsory inclusion of alcohol in motor fuel. Europe has been the chief testing ground for compulsory use of alcohol as motor fuel which has been extensively, and in many cases successfully, agitated during past five or six years. While alcohol admittedly is inferior in certain respects to gasoline for purposes of combustion, the writer of article does not emphasize these considerations. He applies instead crucial test of economic justification for requiring admixture of alcohol to motor fuel. He shows that from whatever source derived, alcohol is several times as expensive as gasoline, and that even where tariffs are highest cost of alcohol is greater than gasoline plus customs charge. He finds that eleven countries with total motor fuel consumption of 576,448 tons are sustaining yearly loss of over $15,000,000, or average of $36. per car through this expensive policy.

May turn wood waste into power alcohol. Idaho Farmer. v. 54, no. 21. October 15, 1936. p. 13. Survey indicates that if power alcohol becomes a reality agriculturist may find his products competing with lumber industry's wastes as a source of supply. Production of ethyl alcohol from wood may, in not far distant future, develop into industry utilizing great quantities of wood waste. This is likely to be true if use of ethyl alcohol for fuel in internal combustion engines becomes a reality in this country. It is expected that under American condi-

Alcohol Fuel. (Cont'd)

tions alcohol may be produced as cheaply from wood waste as from corn and molasses.

Power alcohol plant in Oregon. Pacific Rural Press. v. 132, no. 11. September 12, 1936. p. 277. In Yamill county, Oregon, Yamill County Farm Union, and A.C. Forester, a Portland engineer, are going to build a cooperative still to utilize farm products and make about 500 gallons of alcohol a day. Cost of plant is to be $10,000.

All-American Canal.

All-American Canal progress. Engineering News-Record. v. 118, no.7. February 18, 1937. p. 258-261. 85 per cent of excavation completed January 1 includes most difficult portions. Typical crossings and overpasses. Three years' work yet to be done on project.

Why desilting works for the All-American canal? By C. P. Vetter. Engineering News-Record. v. 118, no. 9. March 4, 1937. p. 321-326.

Barns.

Stiff barn. By B.M. Grady. Capper's Farmer. v. 48, no. 2. February, 1937. p. 8. Advantages of this barn are: 1. Construction features make it rigid, and as nearly wind proof as practical building can be. 2. There is not a post, pillar or brace in the mow, yet upper structure is as solid as any hip roof barn. 3. Owing to reduction in labor on rafters and elimination of braces, total cost of barn is reduced.

Corrosion.

Corrosion of steel by oil well waste waters. By W.F. Rogers and W.A. Shellshear. Industrial and Engineering Chemistry. v. 29, no. 2. February, 1937. p. 160-166. Rapid rates of corrosion of oil well subsurface equipment by some waste waters has prompted a study of the conditions governing corrosion rate. Waste waters of corrosive as well as noncorrosive type were obtained from oil wells, and studied to determine cause of their corrosion rates. Effects of variations in concentration of hydrogen ions, neutral soluble salts, hydrogen sulfide, oxygen, and water-oil ratios were determined. It was concluded that, under oxygen-free conditions and in the pH range of 6.6 to 8.0, oil well waste waters are noncorrosive regardless of soluble salt or hydrogen sulfide content. Addition of oxygen greatly increased corrosion rate of each fluid tested. Presence of oil in range 30 to 100 per cent is protective, and corrosion is evenly distributed and of low penetration rate. Oil concentrations below 30 per cent do not greatly reduce rate of corrosion by oxygen-bearing waters.

Cutting corrosion cost with rubber. Brewers Technical Review. v. 12, no. 2. February, 1937. p. 49. Abstract of a paper delivered by Dr. H.H. Harkins.

Corrosion. (Cont'd)

Nickel and corrosion-resisting nickel alloys. By Robert J. McKay. Industrial and Engineering Chemistry. v. 28, no. 12. December, 1936. p. 1391-1396. Outlines most useful developments in nickel alloys during past few years. General picture of properties and corrosion resistance of commercially pure nickel is given, with reference to detailed figures.

Steels resistant to scaling and corrosion. By Florence Fenwick and John Johnston. Industrial and Engineering Chemistry. v. 28, no.12. December, 1936. p. 1374-1379.

Cotton Machinery.

Cotton picker problems. Farm Implement News. v. 58, no. 4. February 25, 1937. p. 31. Whether cotton by machine will be lower in grade (and as a result in price) than that picked by hand is question that is causing considerable discussion among plantation owners interested in new cotton picking machines, two of which are now on exhibition at Museum of Science and Industry in Jackson Park, Chicago. Cotton pickers under development at present collect some green leaf which lowers grade as determined by governmental specifications unless it is removed. Success of mechanical picker seems to depend upon perfection of machinery for removing green leaf from fiber. Cleaning machinery already developed is highly efficient in removing hulls, stems and sand rather than green leaf. Effect of green leaf in lowering price of cotton will vary owing to different grades of cotton according to governmental standards. It is interesting to note that Argentine government, through its National Cotton Board, expects to purchase one of Rust pickers for experimenting.

Mechanical cotton picker. By J.E. Stanford. Southern Agriculturist. v. 66, no. 10. October, 1936. p. 11.

Reducing power cost per bale. By Orville Adams. Cotton and Cotton Oil Press. v. 37, no. 52. December 26, 1936. p. 3-4. Power consumption per bale may vary fifty per cent.

Dairy Farm Equipment.

Protect with a safety bull pen. Michigan Farmer. v. 187, no. 2. January 16, 1937. p. 34.

Safe bull pen. By Charles L. Dickinson. American Agriculturist. v. 133, no. 26. December 19, 1936. p. 13.

Dams.

Government dams blamed for Ohio flood. Engineering News Record. v.118, no. 9. March 4, 1937. p. 350. Claiming that recent Ohio River floods were caused by government dams built along Ohio River, a Jefferson County, Kentucky grand jury sitting recently in Louisville, asked that direct federal grants be given to compensate Louisville and Jefferson County citizens for flood losses, instead of disaster

Dams. (Cont'd)

loans now being made. Report said that witnesses had testified before the grand jury that construction of dams along Ohio had raised bed of river "about 9 feet" during last ten years. Report further charged that dams were constructed for benefit of private business.

Mountainous earthen dam. By R.G. Skerrett. Scientific American. v. 154, no. 6. June, 1936. p. 306-309. Fort Peck dam. Aid to navigation on "Big Muddy." 100,000,000 cubic yards of earth in the dam. Unique engineering problems.

Why Boulder dam was built. By William Monroe White. Industrial Power. v. 31, no. 5. November, 1936. p. 37-38, 68, 70, 72. Human interest story of why Boulder Dam was developed and what it will accomplish.

Diesels.

Cavalcade of Diesel. By John B. Kennedy. Utah Farmer. v. 57, no. 11. January 10, 1937. p. 3, 12, 14.

Non-technical discussion of Diesel vs. gasoline power plant used in motor trucks. Sugar News. v. 17, no. 10. October, 1936. p. 439-441, 443.

Drainage.

Draining the great fens. By John F. Baker and John Armitage. Civil Engineering. v. 7, no. 2. February, 1937. p. 117-121.

National drainage basin study. By F.H. Fowler. Civil Engineering. v. 7, no. 3. March, 1937. p. 171-172.

Resume of the drainage basin study report. By Abel Wolman. Civil Engineering. v. 7, no. 3. March, 1937. p. 167-171. Activities of the National Water Resources Committee.

Electric Wiring.

Wiring installations on the farm. By John Cooper. Rural Electrification and Electro-Farming. v. 12, no. 141. February, 1937. p. 202-203.

Electricity-Distribution.

Dream coming true. Nearly 140 miles of line to bring electricity to 800 ranchers in Mesa County, Colorado. By Ethel Charleton Hinman. Western Farm Life. v. 39, no. 2. January 15, 1937. p. 3, 12.

Electrification in rural areas. By Claude Windecker. Montana Farmer. v. 24, no. 6. November 15, 1936. p. 6.

Electrification in Russia. Rural Electrification and Electro-Farming. v. 12, no. 140. January, 1937. p. 183. In 1936 output of electricity was more than 32,000 million kilowatt-hours exceeding by 6,000 million kilowatt-hours output of 1935.

Electricity-Distribution. (Cont'd)

Increase farm lines 151% in 8 years. Electricial World. v. 106, no. 49. December 5, 1936. p. 57. Some facts and figures given in account of rural electrification activities of Virginia Electric & Power Company. Rural and farm customers served by company guarantee monthly amount equal to 1½ per cent of cost of rural line construction.

National survey shows companies are doubling rural mileage. Electrical World. News issue. v. 106, no. 42. October 17, 1937. p. 4. President of Edison Electric Institute predicts 160,000 rural customers will be connected this year. Average construction cost $1,250. per mile. Investment charges main cost factor.

New York rural electrification shows sharp gains during year. Electrical World. News issue. v. 107, no. 8. February 20, 1937. p. 4. Report of commission reveals 42.5 per cent of all farms now receive service from utilities. Extensive program accomplished without use of federal funds from R.E.A.

Storm line-loading found unduly high. By G.H. Underhill. Electrical World. v. 106, no. 51. December 19, 1936. p. 36-38, 86. New York survey reveals dubious propriety of retaining heavy loading design for rural lines.

Electricity on the Farm.

At the touch of a switch. By C.H. Hodge. The Bulletin (Hydro-Electric Power Commission of Ontario). v. 23, no. 12. December, 1936. p. 408-412.

Challenge of rural electrification to the Agricultural Engineer. By Grover C. Neff. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 65-67. Some things agricultural engineers can do. 1. See that electrical wiring on the farm is adequate, well laid out and safe. 2. Develop farm machinery suitable for electric drive. 3. Bring about the co-operation of farm experts. 4. Help develop, promote and establish courses in schools and colleges. 5. Support the CREA.

Electric brooders and the conversion of brooders to electric heating. By A.H. Rankin and W. LePage. Rural Electrification and Electro-Farming. v. 12, no. 140. January, 1937. p. 175-177.

Electricity pays its way on the dairy farm. By T.E. Hienton. Electricity on the Farm. v. 10, no. 2. p. 7-10.

Electricity saves man power and cost. Oregon Farmer. v. 60, no. 2. January 21, 1937. p. 23.

Electrification of a fruit farm. By Truman E. Hienton. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 68-70. Water pumping. Spraying with stationary plant. Fruit washing. Heating apple washing solutions. Fruit sizing. Cool and cold storage fruit. Irrigation.

Electricity on the Farm. (Cont'd)

How many kilowatts? By R.U. Blasingame. Pennsylvania Farmer. v. 116, no. 3. January 30, 1937. p. 5, 15.

Joint committee on rural electrification. Pennsylvania Farmer. v. 116, no. 2. January 16, 1937. p. 46, 53. Pennsylvania Joint Committee on Rural Electrification was organized in January, of 1927 to solve various and complex problems encountered in extension of electric power service into rural sections of state. Work of this Joint Committee during past ten years has resulted in increased interest in rural electrification by farm organizations and farmers generally, and by utility companies; a better understanding on part of each as to problems encountered; lower cost to user of electric service on farm and in rural communities and rural dwellers. Under "Pennsylvania Plan" developed by this Joint Committee, it is not necessary for cost of extending electric lines to be financed by farmer. Thus the farmer has been able to conserve his own cash for investment in his own property. Plan is so flexible, however, that it is possible under it, for farmers who wish to do so, to pay cost of building electric lines to serve them. Committee now plans to cease its activities as such. Farmers in state and utilities in state have become conversant with general problems having to do with extension of electric service; simplified rates and uniform practices have been established. Committee feels that situation is now such that it need no longer function and that work which it has fostered, and good it has accomplished may be carried on by Rural Electrification Committee of Pennsylvania State Council of Agricultural Associations and Pennsylvania Electric Association.

Magic farm runs itself. Popular Mechanics Magazine. v. 66, no. 3. September, 1936. p. 321-323.

Rural electrification marches on. By G.W. Mullen. Farmer Stockman. v. 49, no. December 15, 1937. p. 3, 17.

Shall rural electrification be controlled by commissions? Jersey Bulletin and Dairy World. v. 56, no. 7. February 17, 1937. p. 215. If regulatory commissions are given power to control them, "non-profit, co-operative efforts on the part of American farmers to serve themselves with electricity will be doomed to failure," according to Rural Electrification Administrator Morris L. Cooke. On other hand, Mr. Cooke says, if cooperatives are free from commission control "there is more than an excellent chance that we shall see a large proportion of our farm homes lighted by electricity before many years have passed. Outcome of this question may make or break rural electrification movement, now gathering true momentum for first time in our history.

Erosion Control.

Erosion control area established in Utah. Utah Farmer. v. 57, no. 13. February 10, 1937. p. 11. Demonstration area of approximately 100,000 acres in Morgan and Summit counties, in north-central Utah. In cooperation with farmers and livestock producers in area Soil Conservation Service will establish erosion-control practices. Methods

Erosion Control. (Cont'd)

will include retirement of grazing lands to permanent vegetation on steeper slopes; readjustment of grazing areas; introduction of strip-cropping in form of rotations; seed and planting of new pastures; conservation and control of water; and demonstration of woodland management practices leading to erosion control. As part of demonstration in sustained land use, Soil Conservation Service will construct or re-locate fence lines to protect retired grazing land and new plantings, build dams and terraces and other erosion control devices where needed.

Erosion control checks erosion. Scientific American. v. 154, no. 6. June, 1937. p. 326-327.

Snow may become destroyer of soil. By Glenn M. Querna. Washington Farmer. v. 62, no. 4. February 18, 1937. p. 3.

Stop gullies - save your farm. By G.H. Lentz. Southern Agriculturist. v. 66, no. 11. November, 1936. p. 8.

Farm Buildings.

Australian sheepyards and shearing sheds. By George Berrie. Journal of the Ministry of Agriculture. v. 43, no. 7. October, 1936. p. 641-645.

Instruments for farm structures research. By W.V. Hukill. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 59-61.

Portable lambing houses. By B.W. Allred. Western Farm Life. v. 38, no. 24. December 15, 1936. p. 20. Can be made so as to knock down easily, but interlocked for rigid construction.

To hold structures conference, March 5. Northwest Farmer. v. 5, no.11. March, 1937. p. 5. Farm structures conference, designed especially for country builders and dealers in building material, will be held at University Farm, St. Paul, Minnesota, March 5. One-day conference program has been divided into talks and round table discussions. Talks will be given by experts in various fields of the building enterprise, such as air conditioning, low cost of good construction and other similar subjects.

Farm Income.

Cash income of farmers in 1936. Farm Implement News. v. 58, no. 3. February 11, 1937. p. 25. Cash income of U.S. farmers in year 1936, as officially estimated last week was $7,865,000,000, which was 11 per cent greater than the $7,090,000,000 estimated for preceding year. Income from sales of farm products was 16 per cent larger than in 1935, while government payments were only half as large as in preceding year. Substantial gains were recorded in all classes of farm products excepting poultry, income from which was approximately the same as in 1935. Increase on grains was 35 per cent, and on meat animals 25 per cent.

Farm Machinery and Equipment.

By hand or by machine? By Bill McConnell. Iowa Agriculturist. v. 36, no. 5. November, 1936. p. 68. Listed are some of advantages of mechanical corn picker. 1. Picking is completed more quickly and earlier in the season. 2. Machine work is easier than hand picking. 3. Trouble and annoyance in hiring men and in boarding them is largely done away with. 4. Stalks are easier to plow under. 5. When corn is in good condition machine will harvest as efficiently as an average husker. 6. Cost per bushel is generally less. Some disadvantages of a mechanical corn picker are: 1. Original investment is required. 2. Machine will not work under as wide a range of conditions as hand picker. 3. Stalk damage is greater by machine. 4. When corn is machine picked late rain or snow will cause severe damage to the pasturage. 5. Machine picker is not as efficient as hand picker unless conditions are good. 6. Hand picking may be done by regularly employed labor on farm, thus saving cash expense. 7. Mechanical pickers are difficult to operate in muddy or soft ground, and when ground and stalks are frozen. Contrast between international trade in agricultural machines and in the technical progress made in their manufacture. Monthly Bulletin of Agricultural Science and Practice. v. 27, no. 12. December, 1936. p.445-453.

Deere announces damming lister. Implement and Tractor. v. 52, no.4. February 20, 1937. p. 14-15. New No. 751 is five-row unit with 20-in. spacing which opens trenches with chisels. Attachments for converting older listers into dammers also are available.

Developments in farm machines. Montana Farmer. v. 24, no. 10. January 15, 1937. p. 3. New equipment and improvements designed to meet agricultural needs.

Farm equipment costs vs. use. By D. B. Leonard. Electrical World. v. 106, no. 47. November 21, 1936. p. 82.

Farm equipment for 1937, both new and improved. By Research Department of Farm Equipment Institute. Implement and Tractor. v. 52, no. 4. February 20, 1937. p. 10.

Farm equipment for the South. By Research Dept. Farm Equipment Institute. Farm Implement News. v. 58, no. 4. February 25, 1937. p. 27.

Farm Mechanization. By R. Borlase Matthews. Rural Electrification and Electro-Farming. v. 12, no. 141. February, 1937. p. 197-198. Report of recent mechanized farming conference at Oxford.

Influence of machinery on farming practices. Implement & Machinery Review. v. 62, no. 742. February 1, 1937. p. 938-942. Tractor efficiency, - how the user can improve it. Row-crop mechanization, - varied applications to aid labor. Art of cultivation, - where operations may be redundant. Grass drying costs, - users satisfied with methods. Combines in England, - an ingenious modification.

Farm Machinery and Equipment. (Cont'd)

John Deere's conquest of the prairie. By George F. Massey. Farm Machinery and Equipment. no. 1837. January 15, 1937. p. 18-34. One hundred years ago the great plowmaster forged his first steel plow. With the help of loyal dealers and employes, he later built an organization that today serves modern agriculture with equipment built in eleven great farm equipment factories still guided by the spirit of his integrity.

Machine levels fields automatically. Implement Record. v. 34, no.3. March, 1937. p. 34. In operation Eversman leveler rides on V-shaped buster blade in front, and curved smoother blade in rear, leaving wheels free to move up and down when crossing high and low places in ground. These wheels do not carry the weight of machine, but are used for automatic control of blade. The grader blade, which does cut and fill work, is mounted in sub-frame which is hinged to main frame to allow free motion blade up and down. Wheels are mounted on outer ends of two axle cranks which are journaled to main frame. Inner ends of these axle cranks are connected together and to hinged sub-frame which carries the blade. Springs balance weight of sub-frame and blade to make wheels follow the ground. It is then apparent that, as machine is pulled forward, any raise in ground will raise wheels, and in turn, through crank axle, lower blade to cut. Conversely, wheels will lower into any depression and raise blade to fill. This automatic action is direct and positive on even the slightest change of ground level. By this method fine and accurate field leveling is accomplished.

Machinery ideas grow on the farm. Kansas Farmer. v. 74, no. 28. January 16, 1937. p. 20. Considerable advancement in field machinery comes as result of farmers' efforts to meet emergencies. When they find it necessary to devise some tool to meet a condition not before or recently experienced they go ahead and do it. Machinery companies often get their ideas from machines built by farmers. Then these machinery companies test and refine their tools for several years in most cases, before putting them on the market.

Massey-Harris enters small combine field. Implement and Tractor. v. 52, no. 4. February 20, 1937. p. 30-31. Power take-off units in 6 and 8-ft. cuts, with total weight of less than 3,000 lbs. have many advanced features in design.

New blueberry cultivator. By Charles A. Dochlert. New Jersey Agriculture. v. 18, no. 6. November-December, 1936. p. 3. Gives advantages of harrow.

New look at the Massey-Harris baby combine. Farm Implement News. v. 58, no. 4. February 25, 1937. p. 28-29.

Pickup baler. By M.M. Drake. Purdue Agriculturist. v. 31, no. 2. November, 1936. p. 15. Written primarily to inform every reader, and suggest possible uses of machine where management principles warrant such purchase.

Farm Machinery and Equipment. (Cont'd)

Potato sorter is easily made. Oregon Farmer. v. 59, no. 24. November 26, 1936. p. 15. Machine can be home-built at small cost.

Power for threshing. Rural Electrification and Electro-Farming. v. 12, no. 141. February, 1937. p. 196. Comparison of electricity and oil fuel tests at Rothamsted.

Three types of beet harvesters. Pacific Rural Press. v. 132, no. 26. December 26, 1936. p. 716. Types of sugar beet harvesters which are being tried out by agricultural engineers of U.S. Department of Agriculture and agricultural engineers of University Farm at Davis, California.

Using brains with brawn in farm service equipment. By L.W. Hurlbut. Implement and Tractor. v. 62, no. 3. February 6, 1937. p. 24, 28.

What are the machine wages? Northwest Farm Equipment Journal. v. 50, no. 11. November, 1936. p. 40-41. Table 1.- Annual cost of all farm equipment. Table 2 - Cost of operating equipment. Table 3 - Effect of kind of power on operator-and-power costs for plowing and fitting. Table 4 - Effect of kind of power on operator-and-power costs for various farm operations. Table 5 - Relation of acres of grain to cost of binder. Table 6 - Effect of part ownership of ensilage cutter on cost.

Fences.

To make fences last longer. American Agriculturist. v. 133, no. 8. p. 5.

Fertilizer Placement.

Fertilizer placement increases yield. Fertilizer Review. v. 12, no.1. January-February, 1937. p. 12. Yields of snap beans have shown increase of as much as 47 per cent when application was made two inches at side and two inches below seed as compared with placing fertilizer in row directly adjacent to seed. Similar results were obtained with sweet corn and field corn.

Greater profits from the proper placement of fertilizer. Implement and Tractor. v. 52, no. 2. January 23, 1937. p. 10. Newer equipment affords advantages not found in present five million distributing units being used on American farms. Savings in quantity used and in larger returns.

Filters.

Filter sand permeability studies. By F.T. Mavis and E.F. Wilsey. Engineering News-Record. v. 118, no. 8. February 25, 1937. p.299-300. Tests at Iowa Institute of Hydraulic Research provide a practical basis for determining permeability coefficients and the velocity of flow through filter sand.

Fires.

Fire protection for the farm. By William H. Kircher. The Farmer. v. 54, no. 19. September 12, 1936. p. 5, 18-19.

Floods and Flood Control.

Cutoffs lower the flood crest. Engineering News-Record. v. 118, no. 7. February 18, 1937. p. 265-267. Twelve new channels across Mississippi River bends below Arkansas City increases velocity sufficiently to reduce flood heights by several feet at upper end of cutoff area. Vicksburg laboratory model shows flood range.

Droughts and floods. By John C. Hoyt. Engineering News-Record. v. 118, no. 5. February 4, 1937. p. 196-197. Abnormal weather conditions during the past year were reflected in unprecedented floods and a repetition of severe droughts. Average flow of streams was normal, but groundwater levels were generally lower in the West, but without water shortage in storage reservoirs.

Fighting high waters. By H.W. Richardson. Engineering News-Record. v. 118, no. 6. February 11, 1937. p. 225-228. First-hand observation of the battle to control the superflood now raging in the Mississippi Valley.

Flood control begun. By G.B. Pillsbury. Engineering News-Record. v. 118, no. 5. February 4, 1937. p. 192-195. Great floods of last March forced Congress to inaugurate first federal flood-control policy based on local participation, whose execution has been turned over to army engineers. Country-wide series of projects authorized at ultimate cost of over three hundred millions.

Flood control being tested on the Mississippi. Engineering News-Record. v. 118, no. 6. February 11, 1937. p. 222-225. Flood control works costing a third of a billion get first test by the record Ohio River flood now flowing down the lower Mississippi.

Flood menace and erosion problem challenge scientists of many fields. Soil Conservation. v. 2, no. 5. November, 1936. p. 87-94. Information consolidated at noteworthy upstream engineering conference.

Flood protection data. Progress report of the Committee: Discussion. By Gordon W. Williams, Merrill Bernard and Glenn W. Holmes. Proceedings of American Society of Civil Engineers. v. 62, no. 9. November, 1936. p. 1491-1495.

Forecasting floodflows. By Willis R. Gregg. Engineering News-Record. v. 118, no. 5. February 4, 1937. p. 198-199. Experience of the Weather Bureau shows that it is possible to forecast the amount of flood flow in large rivers with reasonable accuracy, but that it is not yet possible to predict where unusual concentration of the precipitation will occur, or what the total precipitation will be.

Half-hearted measures won't succeed for flood control. By Paul B. Sears. Science News Letter. v. 31, no. 826. February 6, 1937. p. 84.

Floods and Flood Control. (Cont'd)

Predicting stages for the lower Mississippi. By E.W. Land. Civil Engineering. v. 7, no. 2. February, 1937. p. 122-125. Modifications required in vicinity of large tributary streams, and procedure for determining gage-lowering due to crevasses, are given special consideration.

Spillway cuts crest of New Orleans flood. By H.W. Richardson. Engineering News-Record. v. 118, no. 8. February 25, 1937. p. 314. Bonnet Carre Spillway, nearly full, cuts flood crest three feet. Flow in floodway reaches 200,000 second-feet.

Weather Bureau plans for better flood forecasting. Science News Letter. v. 31, no. 82. February 6, 1937. p. 85-86.

Why floods? By John M. Kennedy. Nation's Agriculture. v. 12, no. 5. March, 1937. p. 1-2, 11-12. Points out that flood control must start on farms and other catchment areas where rain and melted snow begin their march to the sea.

Floors.

Firesafe concrete floors add strength and safety. By W.G. Kaiser. Iowa Agriculturist. v. 36, no. 5. November, 1936. p. 70. Gives cutaway view showing precast concrete joists.

Fuels.

Combustion qualities of Diesel fuel. By G.D. Boerlage and J.J. Broeze. Industrial and Engineering Chemistry. v. 28, no. 10. October, 1936. p. 1229-1234. Ignition period consists of physical and chemical delay. The former becomes important with heavy fuels, the latter is normally predominant. After-burning is mainly due to uneven distribution and to slow evaporation of fuel deposits on combustion chamber walls; the most favorable mixing conditions are, at best, a compromise between these two. The fuel influences the mixing process by its viscosity, its volatility, and its ignition quality; the optimum value of each property varies with the engine type. A better criterion for volatility is needed. Combustion in C.I. engines is mostly of the destructive type; under certain conditions there is evidence that it may be partially an oxidation process - for example, according to the hydroxylation theory.

Heating system control methods for reducing fuel consumption. By Kalman Steiner. Heating, Piping and Air Conditioning. v. 9, no. 2. February, 1937. p. 85-88, 91. In general heating plant operates at some point below its maximum capacity 95 per cent of the time, which means that control is essential to economy. Efficient control methods of several types are available, and it is the author's purpose to describe them and review their features, as well as to discuss reducing fuel waste by proper control and correct operation and maintenance of plant and building heating systems. Article is particularly valuable in concise explanation of various heat control methods which is included.

Fuels. (Cont'd)

Motor fuel synthesis large Italian project. Oil, Paint and Drug Reporter. v. 130, no. 9. August 31, 1936. p. 4. Plants are being built at Bari, Livorno, and near Florence for the hydrogenation of various available raw materials. One plant will operate on blackish bitumen, obtained from deposits in Albania, which is said to yield excellent light fuel for internal combusion, giving yield of 80 per cent of benzene through hydrogenation process. Other two factories will use lignite and coke by-products.

Motor fuels of the future. By Floyd F. Kishline. World Petroleum. v. 7, no. 6. June, 1936. p. 308.

Portable gasoline supply tanks for refueling tractors away from central fuel storage. By D.C. Willaism. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 58. Useful, economical, and much safer than handling gasoline in small cans on trucks or in automobiles.

Hay Drying.

Mobile equipment for grass drying. Rural Electrification and Electro-Farming. v. 12, no. 141. February, 1937. p. 194-195. Wet grass is introduced by elevator, and is put on first conveyor belt. As it travels along the temperature above grass, which was previously 300 degrees Fahrenheit, drops to about 110 degrees, due to evaporation, but radiant heat emitting panels above and below grass maintain their temperature of 300 degrees Fahrenheit. Grass falls on to conveyor belt to such thickness that it is easily penetrated by radiant heat emission, and thus uniform heating effect is produced, while grass is cascaded from one conveyor belt to another, in five stages before ejection, so that not only is thorough drying ensured, but no labor is required for turning grass during process of drying.

Mobile grass drier. Implement and Machinery Review. v. 62, no. 742. February 1, 1937. p. 943-944. Employs quite different process of drying from that usually adopted.

Taking the weather out of hay-making. By Gerald L. Seaman. New Jersey Farm and Garden. v. 7, no. 9. September, 1936. p. 7, 14.

Hotbeds.

Electric heating of soil in frames. By Charles P. Quarrell. Rural Electrification and Electro-Farming. v. 12, no. 140. January, 1937. p. 181-193. Results of some experiments.

Heat for greenhouse or hotbed. Washington Farmer. v. 62, no. 1. January 7, 1937. p. 18. Hot air system easily made and installed.

Soil heating in Belgium. By G. Cadogan Rothery. Rural Electrification and Electro-Farming. v. 12, no. 141. February, 1937. p. 204.

Hotbeds. (Cont'd)

Collecting and publishing hydrologic data. By Thorndike Saville. Civil Engineering. v. 7, no. 3. March, 1937. p. 175-177.

Insulation.

Building insulation. Successful Farming. v. 35, no. 2. February, 1937. p. 64-65. Daily temperature in certain well-insulated building varied only 15 degrees while outside temperature varied 32 degrees. For winter insulation outer materials of structure should stop wind, while insulating material is best placed inside where temperature is higher. Narrow air space not over three-quarters of an inch is better than wider one in which air currents can start. Insulation for dairy barns having eight-to ten-inch walls of most kinds of masonry is recommended. Cover with 1/2-inch insulation and matched boards inside to prevent frost from forming. Frame construction requires matched boards, windproof paper, 1/2-inch insulation, and matched boards. For dwelling house construction, siding, shingles, stucco, or brick will withstand outside weather. Beneath this outer coat, put windproof paper on sheeting. Inside studding insulating plastering board is used instead of lath. Still another layer of insulation may be placed between studdings.

Tests in Grand Coulee Workers' home show how insulation will reduce heating costs. By Homer J. Dana and R.E. Lyle. Electric Refrigeration News. v. 18, no. 13. July 29, 1936. p. 27, 29.

Irrigation.

Beating the drouth with well irrigation. By A.E. Long. Farm Implement News. v. 58, no. 3. February 11, 1937. p. 38-39.

Bitterroot irrigation. Montana Farmer. v. 24, no. 6. November 15, 1936. p. 3.

Drought and overhead irrigation. By C.W. Skinner. Market Growers Journal. v. 60, no. 4. February 15, 1937. p. 110-111.

Idaho irrigation tunnel. Western Farm Life. v. 39, no. 1. January 1, 1937. p. 25. Completed as part of $1,000,000 program to increase water in Snake River Valley.

Indiana irrigation progress. Indian Engineering. v. 100, no. 5. November, 1936. p. 163-165.

Irrigated Idaho needs more water. Idaho Farmer. v. 54, no. 20. October 1, 1936. p. 5.

Irrigation in humid States pays. By U.S. Bureau of Agricultural Engineering. Farm Implement News. v. 58, no. 3. February 11, 1937. p. 37-38. Five humid states typical of those in which farmers are finding irrigation a help when rainfall is insufficient and number of acres irrigated in each, according to a 1936 report of committee from American Society of Agricultural Engineers, are Ohio, 10,100 acres;

Irrigation.

Michigan, 7,600 acres; New Jersey, 6,000 acres; Virginia, 3,600 acres, and Maryland, 1,150 acres - a total of 28,450 acres. Other humid states in which supplemental irrigation is increasing and number of acres in 1936, according to report, are Minnesota, 895; Illinois, 630; New York, 1,825, and of course Florida, with nearly 63,000 irrigated acres.

Irrigation makes money flow both ways. Washington Farmer. v. 62, no. 3. February 4, 1937. p. 3.

Irrigation of lemons for optimum vigor without reduced production. By T.A. Lombard. California Citrograph. v. 21, no. 10. August, 1936. p. 366, 406. Progress reports on experiments on Rancho Sespe, Ventura County.

Irrigation supply sets record. Idaho Farmer. v. 54, no. 21. October 15, 1936. p. 10. Era of abundance visits Big Wood district.

Irrigation water supplies average about normal. Engineering News-Record. v. 118, no. 9. March 4, 1937. p. 351. Bureau of Agricultural Engineering, in first of its reports for 1937 on depth of snow released in connection with irrigation water supplies in Western States, revealed that, as of first part of February, conditions in general are favorable. In Arizona, New Mexico, Utah and Southern California depth and water content of snow indicate supplies of irrigation water will be above normal during coming year. In northern California, Oregon, Washington, Idaho, Nevada, Montana, Colorado and Wyoming snowfall is below normal for this time of year, but not to any alarming extent. It is possible in all these areas that snowfall during remaining months of winter will more than make up for present apparent deficiency.

Pump irrigation: crop insurance. By Carlyle Hodgkin. Nebraska Farmer. v. 78, no. 23. November 7, 1936. p. 1, 2, 24.

Rain when you want it. By Floyd Duffee and Nieman Hoveland. Farm Implement News. v. 58, no. 3. February 11, 1937. p. 36-37.

Supplemental irrigation. By W.H. Coles. Market Growers Journal. v. 60, no. 4. February 15, 1937. p. 91, 93. Types of irrigation. 1. Flooding irrigation. 2. Ditch irrigation. 3. Sub-irrigation. 4. Deluge system. 5. Portable rain machine. 6. Skinner system of irrigation.

Supplemental irrigation in the Eastern States. By F.E. Staebner. Market Growers Journal. v. 60, no. 4. February 15, 1937. p. 94-100.

Water without rights. By Elmer J. Johnson. Western Farm Life. v. 39, no. 1. January 1, 1937. p. 3, 22. Pump irrigation has numerous benefits, explain experienced western producers.

West must fight for irrigation. Washington Farmer. v. 61, no. 22. October 29, 1936. p. 10.

Lighting.

Lighting of laying houses. By A.H. Rankin and W. Le Page. Rural Electrification and Electro-Farming. v. 12, no. 141. February, 1937. p. 207-209.

A little light is mighty convenient on a dark night. Washington Farmer. v. 62, no. 1. January 7, 1937. p. 5. Yard lighting and lighting of farm buildings provide farmer with cheaper and effective protection from several dangers.

Rural lighting free of some handicaps. By Lawrence C. Porter. Electrical World. v. 106, no. 49. December 5, 1936. p. 74, 76. During 1936 utilities will spend approximately $50,000,000 for rural electrification. Their new lines will serve approximately 157,000 new rural customers. Farm cooperatives are building lines to serve 60,000 more customers.

Miscellaneous.

Attracting better candidates for Civil Service tests. Engineering News-Record. V. 118, no. 9. March 4, 1937. p. 326. Describes method devised by California state personnel board to call in competent candidates for employment in state departments.

Farm to factory. By L. F. Livingston. Scientific American. v. 164, no. 6. June, 1936. p. 319. Chemistry points the way. Soy beans. Tung oil. Starch. Wood pulp. Cotton. Rayon.

Plants grown without soil, by three methods - solution culture, sand culture and subirrigated sand culture. Fertilizer Review. v. 12, no. 1. January-February, 1937. p. 13.

Motors.

Outdoor motors restore arid acres. Electrical World. v. 107, no. 5. January 30, 1937. p. 68. Fifteen 100-hp. electrified irrigation pumps are converting 10,000 arid acres of Arizona Farm Products Corporation into fertile farms suitable for raising and harvesting 7-ft. high, long staple cotton in single season. Power is supplied by Salt River Valley Water Users Association.

Selection of electric motors and their control for agricultural use. By B.P. Hess. Northwest Farm Equipment Journal. v. 50, no. 11. November, 1936. p. 36-38.

Urges polyphase agricultural motor. By R. Borlase Matthews. Electrical World. v. 107, no. 7. February 13, 1937. p. 45-46. British authority records his impressions of the handicaps to farm electrification in America.

Use of Diesel motors on cane plantations. International Sugar Journal. v. 39, no. 457. January, 1937. p. 16. Abstracted from Report of the Agricultural Committee of the Associacion de Tecnicos Azucareros de Cuba. Proceedings of Ninth Annual Conference.

Painting.

Painting during winter maintains farm structures and equipment. By Roy C. Sheeler. Better Farm Equipment and Methods. v. 9, no. 6. February, 1937. p. 8-9.

Plywood.

New developments in plastic-bonded plywood. Architectural Record. v. 81, no. 2. February, 1937. p. 45. In effort to improve quality of their product so as to compete with synthetic resins, plywood manufacturers have begun to use synthetic resinuous bonding agents. This development of plywood is reviewed in article.

Plastic made from sawdust: Forest Products Laboratory. Architectural Record. v. 81, no. 2. February, 1937. p. 47. As part of its research program, Forest Products Laboratory is exploring this possibility and has succeeded in developing plastic from sawdust. Work is still in experimental stage and some further refinements in product are necessary. Laboratory officials express themselves as convinced, however, that plastic can be perfected to point where it can successfully compete with other plastics on market.

Prefabricated houses now made with glued wood. By G.W. Trayer. Science News Letter. v. 30, no. 806. September 19, 1936. p. 185.

Waterproof plywood for house construction. Architectural Record. v.81, no. 2. February, 1937. p. 43. Advantages include (1) Distribution of wood strength in all directions. (Solid wood is strong with the grain and weak across the grain.) (2) Nonsplittability. (3) Reduction of wood shrinkage and swelling to a minimum. (4) Increase of strength/weight ratios several-fold.

Poultry Houses and Equipment.

An engineer's view of the poultry housing problem. By F.L. Fairbanks. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 73-74.

Home-made brick brooder. By D.S. Weaver and C.F. Parrish. Southern Planter. v. 98, no. 2. February, 1937. p. 44. Gives directions for building.

Use care in selecting brooders. Washington Farmer. v. 61, no. 25. December 10, 1936. p. 21. Give requirements for suitable electric type.

Power Farming.

Caterpillar promotes farm power contractor as a new profession. Northwest Farm Equipment Journal. v. 50, no. 10. October, 1936. p. 29-32.

Power Farming. (Cont'd)

Farm Power Contractor. By J.E. Stanford. Southern Agriculturist. v. 66, no. 11. November, 1936. p. 10. Group of more than 125 prominent farmers, agricultural college professors, farm paper editors, railroad executives and others gathered in a conference at Peoria, Illinois, recently to discuss question of farm power service. Out of this exchange of ideas a new farm service took shape which is expected to be a vital help in many farming communities, namely widespread service of farm power contractors. Throughout conference it was emphasized that through timely assistance of farm contractor in seasons shortened by weather conditions, plowing, seedbed preparation and harvesting could be achieved on time by individual farmers. Time gained in seedbed preparation usually pays many times cost of plowing in higher crop yields. But farm power contracting is not going to be a seasonal occupation, it was pointed out by farm managers attending conference. There are to be every day jobs on farms in contractor's community that ordinary farm equipment cannot perform, and from which farmer will be repaid many times over for contractor's work in seasons to come. Farmers will be able to acquire facilities that they believed they could not afford. While it is true the small farm owner could not afford to purchase power machinery for amount of time he would need it during year, still he could not afford to do without use of it in case it was available at a fair price when needed.

Power farming vital to Nation's progress. By Stanley Scearce. Implement Record. v. 34, no. 3. March, 1937. p. 18-19.

Progress and trends in power farming. By H.B. Walker. Implement Record. v. 34, no. 2. February, 1937. p. 18-19. Brief, compact summary of changes which today play such a vital part in the drama of the modern farm.

Public Works.

Resources Committee submits National Public Works program. Engineering News-Record. v. 118, no. 6. February 11, 1937. p. 240. President Roosevelt recommends adoption of a standing six-year public works plan, based on selection and priority of projects. Planning and allocation of funds would be placed under direction of a central advisory board.

Pumps and Pumping.

An automatic water supply is a money saver. By Charles E. Seitz. Electricity on the Farm. v. 10, no. 2. February, 1937. p. 14-15, 18. Shows typical deep well pump installation.

Pumps prove popular. By Tom Leadley. Nebraska Farmer. v. 79, no. 2. January 16, 1937. p. 28. Surveys and test wells to determine adaptability of regions and farms for pump irrigation are important service which the University of Nebraska has been conducting for years. It is highly important that individual farmers have such information before investing money in well drilling and pumps. Depth to water, volume of water and adaptability of soil and farm for irrigation, are three governing factors.

Pumps and Pumping. (Cont'd)

Water to pump on the land. By Ivan D. Wood. Nebraska Farmer. v. 79, no. 3. January 30, 1937. p. 3, 18.

Reclamation.

Reclamation - racket or resource? By L.E. Fraudenthal. Nation's Agriculture. v. 12, no. 2. December, 1936. p. 8-9, 12, 14.

Reclamation as an aid to industrial and agricultural balance. By Ernest P. Goodrich and Calvin V. Davis. Proceedings of American Society of Civil Engineers. v. 62, no. 9. November, 1936. p. 1377-1408. Reclamation projects scattered over Western States can have a profound influence in strengthening the link between factory and soil because many of these districts are ideally suited for development as complete economic units rather than as agricultural projects alone. Review of benefits that may be obtained by co-ordinating industrial and agricultural activities on reclamation projects is presented. Writers have studied problem from three angles: First, decentralization of industry; second, diversification of labor; and third, co-ordination of industry and agriculture. Part I is devoted to review of basic principles of each of these factors. In Part II these principles are applied broadly to actual project to illustrate industrial and social growth that could follow construction of hydraulic works in given area. These potential benefits are illustrated further in Part III by more detailed analysis which demonstrates possibilities of co-ordinating industry and agriculture within one of irrigation districts that will benefit from projects. Although conclusions are based on specific investigations, they would also undoubtedly apply to many of new irrigated developments that have been made available by Boulder Dam, and other great water conservation projects.

Red River of the North.

Water plan for the Red River of the North. By W.W. Horner. Civil Engineering. v. 7, no. 3. March, 1937. p. 172-174.

Refrigerants.

Certain technical aspects of "Freon" refrigerants of interest in relation to refrigeration research. By R.J. Thompson. Agricultural News Letter. v. 5, no. 3. p. 54-62. Discusses safety properties and some other characteristics.

Refrigerator Cars.

Refrigerator car tests in Germany. By Alexander Ball. Refrigerating Engineering. v. 33, no. 2. February, 1937. p. 96-97.

Refrigerator Lockers.

Community cold storage lockers in the Northwest. By J.W. Emig. Ice and Refrigeration. v. 92, no. 2. February, 1937. p. 103-104. Development of refrigerated locker storage offers valuable service to rural residents. Description of modern plant at Mt. Vernon, Washington.

Refrigerator Trucks.

Ice refrigerated trucks. By H.L. Lincoln. Refrigerating Engineering. v. 33, no. 3. March, 1937. p. 154-156.

Refrigerators.

Specifications of 1936 household electric refrigerators. Electric Refrigeration News. v. 18, no. 9. July 1, 1936. p. 6.

Usage load of household refrigerators. By W.L. Holladay. Refrigerating Engineering. v. 33, no. 2. February, 1937. p. 83-85. Conclusions are: 1. Use of random sampling field testing can and should serve as a valuable check on factory design data. 2. Effect of temperature in actual usage is to raise energy consumption about 3.3% per degree from base temperature. 3. Effect of family size is to raise energy about 20% of leakage for each person using refrigerator. 4. Refrigerator size in household market has almost no effect on energy consumption.

Water cools refrigerators as it evaporates. Popular Mechanics. v. 66, no. 3. September, 1936. p. 379. Panels of porous ceramic clay extend into a water bath in the base, and act like wicks to draw up moisture. Evaporation sufficient to lower temperature of box and its contents considerably is brought about by warmth and movement of air in room.

Refrigeration.

Bureau enlarges meats laboratory. Ice and Refrigeration. v. 92, no. 3. March, 1937. p. 166-168. Illustrated description of additions and improvements made to meats laboratory at Bureau of Animal Industry, U.S. Department of Agriculture at Beltsville, Maryland.

Cold storage on the farm. Market Growers Journal. v. 60, no. 1. January 1, 1937. p. 27.

History of refrigeration before 1890 records founding of companies active today. Air Conditioning and Refrigeration News. v. 19, no. 6. October 7, 1936. p. 6-7. Frick, Vilter, York, and De La Vergne active in development of industry in early period.

Research.

Research of the Houston Convention of the Association of Land-Grant Colleges and Universities. Experiment Station Record. v. 76, no. 2. February, 1937. p. 145-147.

Rio Grande.

Rio Grande joint investigation. By Harlan H. Barrows. Civil Engineering. v. 7, no. 3. March, 1937. p. 174-175.

Silos.

Capacity of silos. Michigan Farmer. v. 187, no. 2. January 16, 1937. p. 27. Table.

Measuring the capacity of silos. Jersey Bulletin and Dairy World. v. 56, no. 5. February 3, 1937. p. 156.

Silt.

Modern conceptions of the mechanics of fluid turbulence: Discussion By Warryn E. Wilson and Theodor von Karman. Proceedings of American Society of Civil Engineers. v. 62, no. 9. November, 1936. p. 1430-1432.

Reservoir silting in the New River watershed. By Carl B. Brown and Farrell F. Barnes. Soil Conservation. v. 2, no. 5. November, 1936. p. 95, 106-107. Results of surveys also indicate quantitatively, minimum rate of soil removal to be expected from watersheds similar to that of New River. Special feature of these investigations was study of and effect of one or more reservoirs on silting rate of other reservoirs downstream.

Tires.

Effect of tractor tire size on drawbar pull and travel reduction. By L.W. Hurlbut and C.W. Smith. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 53-57.

Open-tread wheels on tractor do not pack ground. Popular Mechanics. v. 66, no. 3. September, 1936. p. 408. Self-cleaning tractor wheels which do not pack the ground, and also remain free of dirt have open-tread design with side rims angled toward center circumference, and spiraled cross cleats so spaced as to permit weight of tractor to be carried from one cleat to another, thus reducing vibration. Spokes are attached to inner rim, leaving dirt free to fall through wheel and onto ground. All joints are arc-welded, and width and thickness of steel rim vary with weight of tractor on which they are used. It is said wheels offer better traction in hard or loose dirt and thus save fuel.

Tractors.

Farm tractors increase. Missouri Farmer. v. 28, no. 23. December 1, 1936. p. 13. From 505,933 in 1925 to 1,174,889 in 1935 tractors have progressively increased in numbers every year on American farms. Largest increase occurred in 1926, 15.5%, while smallest increase occurred in 1934, 1.2%. Reason for increase in tractor numbers on farms despite depression are attributed to scarcity of horses, increasing feed costs for horses, and ability to buy tractors on installment plan, whereas horses mostly sell for cash.

Tractors. (Cont'd)

Full tractor loads, why and how. By A.J. Schwantes. Implement and Tractor. v. 52, no. 4. February 20, 1937. p. 11-44. Greater proportionate cost of part load operation can be largely offset by using larger machines, or combinations of implements. Some savings in higher speeds.

Implement engineer views small tractor. Wisconsin Agriculturist and Farmer. v. 64, no. 2. January 16, 1937. p. 7.

Implement engineer's viewpoint on small tractor. Market Growers Journal. v. 60, no. 3. February 1, 1937. p. 82-83.

More valve sense is basic need in tractor service. By C.W. Smith. Implement and Tractor. v. 62, no. 3. February 6, 1937. p. 25, 28.

Tractors on farms increase in number. Wisconsin Agriculturist and Farmer. v. 63, no. 22. October 24, 1936. p. 16. Estimates that there were 1,123,251 tractors on farms on January 1, 1935, as compared to 920,032 on January 1, 1930, increase of about 25 per cent. It also estimates that this number has been increased to 1,174,889 as of July this year.

Tung Oil.

New experiment station will study all phases of tung oil production. Cotton and Cotton Oil Press. v. 38, no. 2. January 9, 1937. p. 3-4. Departments of agriculture of several southern states in co-operation with the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce, the United States Department of Agriculture, and the Works Progress Administration, are turning their attention to the development of this new industry.

Tung oil production in America, - its history and progress. Part 2. By C.C. Concannon. Cotton and Cotton Oil Press. v. 37, no. 49. December 5, 1936. p. 6-7, 15.

Up-Stream Engineering.

Purpose of up-stream engineering and its hope. Outdoor America. v. 2, no. 1. November, 1936. p. 4-5, 11.

Ventilation.

Proper barn ventilation pays in increased dairy output. By C.M. Edwards. Implement and Tractor. v. 52, no. 2. January 23, 1937. p. 26, 36.

Science studies effect of heat and humidity on dairy cows. By Gene Day. Taylor-Rochester. v. 26, no. 3. Third Quarter, 1936. p. 118-119.

Water Conservation.

Planning for water conservation. By O.W. Israelson. Utah Farmer. v. 57, no. 12. January 25, 1937. p. 3, 10, 15.

Water Conservation. (Cont'd)

Water conservation engineering in Northern Great Plains. By L.C. Tschudy. Agricultural Engineering. v. 18, no. 2. February, 1937. p. 63-64, 67.

Water Heating.

Test efficiency of dairy water heaters. By J.M. Fore. Electrical World. v. 107, no. 5. January 30, 1937. p. 67. Early types of electric water heaters for dairy use were not very practical due to inadequate insulation, high wattages and uncontrolled heat. Experimental work on heaters of this type was started at Purdue Experimental Station in 1931, and is an active project at present time. Tests were made on each new type as it was put on the market, and comparison of figures on efficiencies will indicate improvements made.

Water Supply.

Running water, by all means. By W.H. McPheters. Farm and Ranch. v. 55, no. 24. December 15, 1936. p. 7.

Weeds.

Weed control and eradication on roadsides. By O.K. Normann. Public Roads. v. 17, no. 12. February, 1937. p. 281-300. Study of present practices and their practical application.

Weirs.

Determination of water profiles over weirs and flumes. By Sherman K.R. Pandit. Indian Engineering. v. 100, no. 6. December, 1936. p. 192-200.

Theory of broad crested weir. By B.M. Bharadwaj. Indian Engineering. v. 100, no. 6. December, 1936. p. 202-204.

Wood.

Controlling the shrinkage and swelling of wood. Architectural Record. v. 81, no. 2. February, 1937. p. 46-47. Research in this direction has been under way at Forest Products Laboratory. Investigations are described.

Minimizing wood shrinkage and swelling. Treating with synthetic resin-forming materials. By Alfred J. Stamm and R.M. Seborg. Industrial and Engineering Chemistry. v. 28, no. 10. October, 1936. p. 1164-1169. Method of forming synthetic resins within the fine capillary structure of wood as a means of minimizing swelling and shrinkage is described. Antishrink efficiencies as high as 70 per cent have been obtained when the wood took up 30 to 50 per cent of its weight in resin. Efficiencies as high as 50 per cent have been obtained with as little as 15 per cent increase in weight of wood. This efficiency is not due to decrease in rate of absorption of moisture, as is case for waxes previously described, but to an equilibrium change. Prepolymerization of the resin-forming mix before treatment decreases antishrink efficiency. No loss in efficiency results upon cutting the wood. The hardness and strength across the grain of the wood are appreciably increased by treatment. Treated wood can be satisfactorily glued, and glued specimens can be treated without affecting the glue joints.